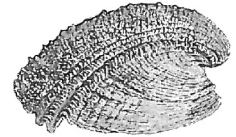


CATCH SHARES IN ACTION

Chilean National Benthic Resources Territorial Use Rights for Fishing Program



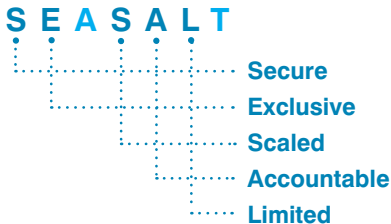
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Tonya Van Leuvan

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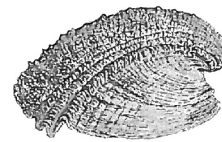
Van Leuvan, T. (2013). Catch Shares in Action: Chilean National Benthic Resources Territorial Use Rights for Fishing Program. Environmental Defense Fund.





CATCH SHARES IN ACTION

Chilean National Benthic Resources Territorial Use Rights for Fishing Program



SPECIAL DESIGN FEATURES



MULTI-SPECIES, GROUP-ALLOCATED,
AREA-BASED, NON-TRANSFERABLE

Among the largest area-based catch share programs in the world, the Chilean National Benthic Resources Territorial Use Rights for Fishing Program (TURF Program) includes over 17,000 artisanal fishermen co-managing over 550 distinct areas along the coast. The voluntary system primarily manages loco, Chile's most valuable mollusc, and provides secure access to benthic resources to groups of artisanal fishermen. Management is built on science performed by universities and consultants, resulting in co-management by the government, industry and the private sector.

In 1991, Chile began implementing one of the largest area-based catch share programs in the world. The program focuses on managing the artisanal small-boat fishermen targeting nearshore benthic resources, specifically loco, the Chilean abalone. Through the program, established groups of fishermen from sanctioned “caletas,” or coves, are granted exclusive access to publicly owned benthic resources via an area concession called Management and Exploitation Areas of Benthic Resources, commonly referred to as Territorial Use Rights for Fishing (TURFs) (Gallardo Fernández, 2008). Loco must be managed within a TURF and numerous other species are also eligible for exclusive use rights within the system.

Chile's TURF Program currently includes over 550 uniquely managed TURFs spanning Chile's 2,500+ mile coastline.⁸ Not all portions of the marine area are currently managed via TURFs, but much of the coast is eligible to participate in the TURF Program. In 2004, around 5,000 metric tonnes of loco were landed under the TURF Program and the export value for loco was U.S. \$55 million. A number of government agencies oversee management of the TURF Program including the Undersecretary of Fisheries, or Subsecretaria de Pesca (SUBPESCA), the National Fishing Service, or Servicio Nacional de Pesca (SERNAPESCA) and 13 regional fishing councils and five Zone Fishing Councils, or Consejos Zonales de Pesca.

SYNOPSIS

⁸ Each TURF is managed independently, but must abide by the regulations set forth by the government. Collectively, they are referred to as the TURF Program.

Road to a Catch Share

The loco (*Concholepas concholepas*), a sea snail also known as the “Chilean Abalone,” is Chile’s highest value mollusc species and important for artisanal fishermen, who have been harvesting loco for decades. In the mid 1970s, a loco export market developed and shortly thereafter stocks began to rapidly decline. From 1981 to 1992, managers implemented numerous conventional management approaches, including season limits and catch limits, with little success. Catch limits were continually exceeded by large amounts, and seasons became shorter and shorter. In 1990, managers implemented a total closure on the loco fishery for two years.

In response to localized loco stock depletion, some fishermen and marine ecologists instituted informal TURFs as early as 1988. They rotated exploitation through experimental no-take zones and open areas and called the program Natural Shellfish Restocking or Repopulation via Rotational Exploited Areas. These fishermen regulated the areas themselves and were exempted from the loco total closure of 1990 to 1992.

Primarily to address the rapid decline in loco, the government implemented a General Fishing Law in 1991 that requires fishermen to harvest loco within an established MEABR or TURE. Rather than implementing TURFs from the top down, the law created a voluntary application-based system with three main components. First, the government identified a series of eligible land-based caletas or coves. Second, groups of fishermen, mostly residing in these caletas, are eligible to apply to the government to manage the adjacent benthic resources via exclusive access. The application process requires, among other things, an independent scientific assessment of the resources in the area, with particular attention to loco. Finally, upon review, the government grants a TURF to the fishing group for their exclusive use and requires them to co-manage the resources with the government, consultants and/or universities. The ban on loco fishing outside of TURFs provides a strong incentive for fishermen to form or join organizations and apply for official recognition.

Performance

More than 10 years after implementation, the catch share program is meeting many of its goals. Importantly, the TURF Program has also been successful in assuring access for the artisanal sector and improving knowledge of the resources. Over 17,000 artisanal fishermen participate in the catch share program and every TURF is required to conduct regular stock assessments. Furthermore, landings have increased as much as five-fold, the mean sizes of individual organisms has increased, catch-per-unit-effort is up (Castilla and Gelcich, 2008), and some fishing organizations have established no-take areas (areas in which fishing is prohibited) to enhance spawning within their TURF.

The program has challenges and managers are fine-tuning certain aspects. For example, some overharvesting and illegal harvesting does still occur, especially in open access areas and by fishermen who are not within the established caleta and TURE. There have also been instances where fishermen modify their TURF to obtain the maximum revenue possible, including systematically removing predators (Castilla and Fernandez, 1998),

seeding the area with target species taken from other locations and intentionally leaving loco prey species within the system (Castilla and Gelcich, 2006). In response, the government has clarified that resources may only be brought into the TURF once, during its formation (Castilla and Gelcich, 2006), and issued a Regulatory Decree that states that predators should not be removed so as “not [to] inflict negative impacts on [the] environment” (Castilla and Fernandez, 1998).

STEP 1 IN ACTION

Define Program Goals

Managers and legislators identified a variety of goals—biological and ecological, economic and social—when developing and implementing the TURF Program. The Undersecretary of Fisheries (SUBPESCA) identified the following key program goals (Gallardo Fernández, 2008):

- Contribute to the conservation of benthic resources
- Contribute to the sustainability of artisan economic activity
- Maintain or increase biological productivity of benthic resources
- Increase knowledge of the functioning of benthic eco-system
- Generate useful information for management
- Promote participative management

The goals were informed by the experimental no-take zones and marine preserves, which resulted in natural restocking of benthic resources. Furthermore, managers recognized the need to alleviate the pressure of migrating fishermen on localized productive benthos (Castilla and Gelcich, 2006; Gelcich et al., 2009) and from an administrative point of view, desired to decentralize fisheries management (Gallardo Fernández, 2008).

STEP 2 IN ACTION

Define and Quantify the Available Resource

The catch share program was developed primarily to manage loco, Chile's most economically important benthic artisanal resource. Loco are required to be managed via the TURF Program and most TURFs target loco. However, all species found within a TURF can be included in the official management plan and extracted by members of the associated fishermen's organization (Castilla and Fernandez, 1998).

Most of the TURFs are multi-species, in which the management plan identifies more than one species that fishermen are able to harvest. At least 63 species including molluscs, algae, crustaceans, finfish and other invertebrates are landed under the TURF Program. Other than loco, the most common species in the catch

share program are “lapas,” several species of key-hole limpets; the “erizo,” or red sea urchin (*Loxechinus albus*); and a sea snail species. Of the officially sanctioned management plans, 80% include loco, 70% include lapas and 30% include erizo (Castilla and Gelcich, 2008). While 100% of legally caught locos are under the catch share program, only 5% of the lapas and 1% of the erizo landings come from TURFs.

The TURF and caleta system occurs intermittently along the entire coast of Chile and has already granted exclusive access to over 100,000 hectares through a series of area concessions (Castilla and Gelcich, 2008). In 1998, the government established an official list of permanent coves or caletas. Any fishing association within one of the official caletas is eligible to establish a TURF. There are already over 550 TURFs from 453 different permanent coves (some coves have more than one TURF and others are only “temporary coves”). Each TURF averages about 100 hectares in size and encompasses all or part of geologically delineated caletas (small bays). Most TURFs occur on state property, which makes up 56% of the Chilean coast, primarily in the northernmost and southernmost regions in Chile.

Most artisanal fishing activities occur outside the catch share program, although all loco, Chile’s most valuable benthic species, must be caught within the system. Some official coves have not yet started or completed the application process, and there are areas that have purposefully been left as open access and are fished by fishermen who are members of organizations managing nearby TURFs and by fishermen who do not participate in the catch share program.

When a fishing organization from a sanctioned caleta applies for a TURF, they are required to submit an initial baseline study of the claimed area, including population assessments for species requested for harvesting. This study is conducted by an external consultant and used to establish the catch limit, when possible, for requested benthic species. A catch limit is required for loco and the Undersecretary of Fisheries confers final approval of the TURF only after scientific recommendations are made. Every fishing organization granted a TURF is required to conduct yearly follow-up assessments of stocks in the management area to assess the species’ health, adjust catch limits and determine if species without catch limits are still open for fishing. Indicators such as declining catch-per-unit-effort, disappearance of an indicator species and social cues such as amount of infighting amongst members (Molyneaux, 2007) are used to manage species in the TURF that do not have an established catch limit.

STEP 3 IN ACTION

Define Eligible Participants

Defining eligible participants was an important aspect for meeting the goals of the catch share program. The program is exclusively designed to manage artisanal fishermen in the nearshore waters, and there are many provisions outlining participation. First, the program allocates secure access to groups, rather than to individual fishermen. The government outlines specific requirements for groups that are eligible to apply. Second, in order to meet the goal of encouraging artisanal fishermen, the program also outlines clear rules regarding membership within groups.

Only cooperatives, unions, or guild associations can apply for a TURF. As of 2006, approximately 42,000 registered artisanal fishermen (over 75% of all registered artisanal fishermen) were organized into about 680 fishing organizations. This includes 500 unions, 120 guild associations and 30 cooperatives. Three hundred and twenty of these organizations, including 17,000 fishermen, have been granted TURFs. These range in size from 25 to nearly 900 fishermen (Cancino, et al., 2007).

Organizations that are granted TURFs can only be comprised of licensed artisanal fishermen. The law distinguishes four types of artisanal fishermen:

1. Shellfish divers, who extract molluscs, crustaceans or echinoderms and must complete formalized training including theoretical and practical instruction
2. Seaweed collectors, who collect seaweed
3. Fishermen, who are captains or crew of an artisanal boat
4. Ship owners, who are limited to one or two artisanal boats, defined as 18 meters or less in length and 50 tonnes or less; if the ship owner has two registered boats, they together must not exceed a combined 50 tonnes

All fishermen within the catch share program must belong to a fishing organization, and reside, at least part-time, in the caleta adjacent to the defined benthic area. A fisherman may belong to multiple categories, e.g., shellfish diver and fisher, but is not permitted to be registered in more than one region (Castilla and Gelcich, 2008). The main purpose of this regulation is to prevent migration pressures on productive benthic areas. If an artisanal fisherman moves, he must resign his rights to the original region and request permission for the new one (Bernal et al., 1999).

While there are rules against excluding members who meet these initial requirements, the fishing organizations can create additional requirements such as an initiation fee and an apprenticeship, perhaps unpaid, including harvesting and/or assisting with monitoring and enforcement (Cancino, et al., 2007). Indigenous peoples in Chile fall under the same laws and must apply for licenses within one of the above artisanal categories (Castilla and Gelcich, 2008).

STEP 4 IN ACTION

Define the Privilege

The TURF Program allocates area-based privileges to eligible participants. The primary target species, loco, is required to have a catch limit. In some TURFs, additional species are extracted, which may or may not have identified catch limits. As science and information improve, more and more TURFs have species for which scientifically determined catch limits are established.

Successful applicants are granted a TURF for four years and groups can renew the area concession by submitting another application. Fishing organizations can lose their access if the organization fails to pay yearly taxes or if the members use the resources in a non-approved fashion, including introducing exotic species, extracting organisms during banned periods, capturing species under the minimum size, or using forbidden techniques for capture.

The program is non-transferable: Organizations in sanctioned caletas are not allowed to transfer their secure TURF allocation to another group or area (Castilla and Fernandez, 1998). If an individual fisherman leaves an area or an organization, he surrenders any access to the TURF. It is unclear, and likely variable, how organizations manage their areas and quotas. It is possible that an organization may divvy up the catch limit and allocate it to individuals, in which case they may allow transferability among their own members.

STEP 5 IN ACTION

Assign the Privilege

Initial share allocation has been an ongoing process due to the voluntary, application-based nature of the program. Rather than implementing a comprehensive program at one time, eligible organizations are allowed to apply on a rolling basis.

There are two “allocation events” for establishing and fishing within a TURF. First, the government allocates a TURF, or specific benthic area, to an eligible group of fishermen upon review and approval of an application. Then, the group must determine how to manage fishing among its members.

Any fishing organization made up of artisanal fisherman can apply for a TURF. Fishing organizations must create a “Management Plan and Exploitation of Area” application to apply for exclusive spatial privileges and rights to harvest certain species within these areas. First and foremost, the requested area must include the natural habitat of the main targeted species, be on the list of official caletas, and must not overlap with previously established exclusive areas (Gonzalez, 1996). Additional application requirements include:

- An initial baseline study of the requested area conducted by an external scientist
- Population assessments and background information for each requested species, i.e., species the association plans to target
- Proposed exploitation strategy for each requested species
- Proposed conservation measures
- Market information
- Proposed research methods to meet conservation and management data requirements
- Description of the geographic area, including coordinates

- A list of all members, including the inscription number and the fishermen's classification as listed in the National Register of Artisanal Fishermen

If modifications to the application are required, the fishing organization must make the necessary changes and reinitiate the project from the beginning. If more than one fishing organization applies for a TURF in the same cove, priority goes to those located nearest the resource, followed by those with the most members, followed by the oldest. SUBPESCA reviews and approves applications and SERNAPESCA generates a written agreement granting exclusive, area-based rights to the fishing organization.

Once the application is approved and the TURF is granted, fishing organizations choose how to administer their own fishing activities. For species with a catch limit, there are a number of basic approaches that have been used. Some organizations evenly distribute the catch limit among fishermen or among diving teams (divers and crew members). Others allow fishermen to fish as they choose until the catch limit is reached; in these cases the fishermen pay a percentage of catch profits to the fishing organization, which then divides this among members who participated in organization-wide duties. Sometimes fishermen pool all profits and then evenly distribute the profits to active fishermen and inactive fishermen who take part in other activities required for running the program.

STEP 6 IN ACTION

Develop Administrative Systems

The administrative systems for the catch share program are largely decentralized and conducted by each fishing organization that has been granted a TURF. Participants are required to collect landings data for all managed species including the number of individual organisms extracted, size and location. This information, along with the yearly stock assessments and extraction plan, are submitted to the government for review. The National Fisheries Service verifies the information against sampling data gathered by inspectors. For some species, organizations also issue tickets which record the diver's name and the depth at which the species was collected, and track the species to the markets (Molyneaux, 2007). Each organization hires independent scientists to conduct stock assessments and determine the annual catch limits.

Fishermen that illegally fish loco outside of TURFs, poach within TURFs, or break fishing organization rules are subject to penalties ranging from exclusion from fishing for a specified time period, banishment from the TURF Program or prosecution (Molyneaux, 2007). Despite these penalties, theft has been a problem and some fisheries organizations feel they have inadequate resources to monitor and enforce against illegal activities (Gelcich et al., 2009). This may be an area that needs future attention.

The cost of the catch share program is shared by the government and participants. Fishing organizations are required to pay application fees and fund baseline studies, annual stock assessments, and often monitoring and enforcement of the TURF. With each renewal (every two or four years) a tax is imposed on the fishing

association based on hectares under the TURF. Some organizations feel the cost burden is too high and have proposed basing the fees on amount of extracted resource, market prices and revenue, instead of a hectare-based flat rate. Additionally, some fishing organizations would prefer to conduct their own scientific assessments rather than pay consultants (Castilla and Gelcich, 2006; Gelcich et al., 2009).

STEP 7 IN ACTION

Assess Performance and Innovate

The program has undergone a number of innovations. Interestingly, from 1993 to 1997, Chile experimented with a global loco quota, administered through “tickets” equivalent to a specific amount of loco. This system was not very successful because it was too easy for divers to forge the tickets and too costly to administer this program along Chile’s long coastline. Upon assessment, managers replaced the global quota-based system with the current TURF system.

Fishermen have also innovated within the program. Some fishing organizations have combined into larger marketing cooperatives in order to sell resources between their organizations and create economies of scale for exportation. For example, in central Chile, fifteen fishing organizations created the PACIFICOOP to form strategic alliances with exporters and generate better prices. In Southern Chile, five fishing groups created a private company called TERPESCAR, which has gained rights to administer landing ports, thereby generating further income (Castilla and Gelcich, 2008). Near some wealthier urban areas, fishermen have further enhanced their profits by creating and supplying “live” fish markets and developed dive tourism within the TURF (Cancino et al., 2007).